**State of California** **The Resources Agency**

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**MEMORANDUM**

To: Project Coordinator
Resources Agency

Mr. Rick Breitenbach, Assistant Director
CALFED Bay-Delta Program
1416 Ninth Street, Suite 1155
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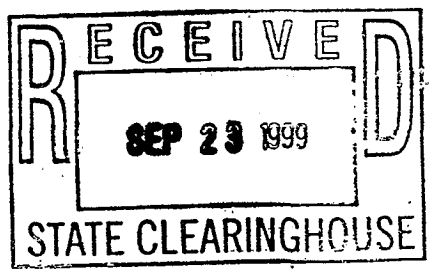
Date: September 23, 1999




From: **Steve Arthur, Chief Deputy Director**
**Department of Conservation**

Subject: CALFED Bay-Delta Plan Draft Study Environmental Impact Statement/Environmental Impact Report (DEIR/S) - **SCH 96032083**

The California Department of Conservation has reviewed the above referenced DEIR/S. Specifically we have analyzed the document with respect to seismic hazards, agricultural land conservation, and natural gas resources. We offer the following comments for your consideration.

Seismic Hazards

The Department's Division of Mines & Geology (DMG) is responsible for mapping and disseminating information on the State's geologic resources and hazards. Division seismologists and geologists have studied the geology and ground motion of the Bay-Delta region. Our expertise and experience have pertinence to the issue of Delta levee stability. Therefore, the following comments focus on Section 5.5 (Geology & Soils) of the DEIR/S.

1. The DEIR/S Technical Appendix, "Levee System Integrity Program Plan" contains a December 1998 report, "Seismic Vulnerability of the Sacramento-San Joaquin Delta Levees" (hereinafter referred to as the "Seismic Vulnerability Report"). This report contains appropriate seismology and geotechnical information (including maps, tables and diagrams) that should at least be summarized in Section 5.5. The report correctly identifies the susceptibility of the Delta levees to failure from earthquake ground motion. Currently, however, the DEIR/S fails to acknowledge this potential impact (page 5.5-2, "Potentially Significant Adverse Impacts"). Specifically, we recommend that the DEIR/S be modified to include the following items from the Seismic Vulnerability Report.

   a. We recommend that the text on Delta seismicity (page 5.5-9 of the DEIR/S) be rewritten to include relevant material from the Seismic Vulnerability Report.

b. Figure 5.5-4 (Faults Within and Near the Delta) does not reflect the current knowledge of DMG with regard to seismogenic faults in the Delta. For example, the Coast Range–Central Valley Blind Thrust Fault is not shown. Refer to Figure A-2 or Figure 3-1 for the DMG Statewide Model that shows the Coast Range–Central Valley Blind Thrust Fault.

c. Figure 4.1 of the Seismic Vulnerability Report, entitled "Damage Potential Zones within the Delta", reports the earthquake susceptibility of Delta levees:

Damage Potential Zone I = 20 levee miles
of highly susceptible earthquake-induced levee failure;

Damage Potential Zone II = 301 levee miles
of medium to medium-high susceptibility;

Damage Potential Zone III = 116 levee miles
of low to medium susceptibility; and,

Damage Potential Zone IV = 223 levee miles
of low to medium susceptibility.

The information in Table 4.1 should be brought forward as part of Section 5.5 in the DEIR/S. This Table presents relevant information for the main DEIR/S text in terms of significance of seismic impacts, and feasibility of mitigation. The analysis and systematic evaluation of the seismic stability of these 660 miles of levees should be given priority as part of the mitigation of the program's seismic impacts. Included in this analysis, as well as in the above inventory, should be the levees of Sherman Island in Damage Potential Zone I. Also, the text of the Section will need to be amended to recognize the susceptibility of the Sherman Island levees, a vulnerability that is clear from Figure 4.1, but otherwise not discussed in Section 5.5.

d. We suggest additional discussion of the soil amplification factor of 1.6 referred to in the Seismic Vulnerability Report, particularly with respect to the value's derivation. In the same report, the concept of "levee-failures-per-mile" appears to be related to how the breadth of an individual failure is measured in the field. This concept should also be explained further in the final document.

e. Besides the 660 miles of levees evaluated in the Seismic Vulnerability Report, there are another 440 miles of levees that exist at higher elevations within the legal limits of the Delta that were not included because they retain significant

depths of water only during the flood season. (Refer to page B-1 of the Seismic Vulnerability Report.) It would be useful to show a map of both types of levees, and then evaluate the probability of a winter flood (e.g., January-February 1997) occurring at the same time as an earthquake, as well as the effects of such an event on levee stability.

f. The Seismic Vulnerability Report, Section 6, "Mitigation of Seismic Levee Vulnerability" (page 30-31) includes a good discussion of potential mitigation measures pertinent to addressing seismic impacts on levees. We suggest that the four mitigation points set forth in Section 6 are brought forward to the main DEIR/S.

2. On July 1, 1999, DMG published a new Seismic Shaking Hazard Map of California (DMG Map Sheet 48). This map was not ready until after the DEIR/S was circulated for public comment. However, the Department suggests that an extract of this map be added to Section 5.5, Geology and Soils, of the final EIR/S. We have prepared an extract for your use (attached color plate) in page-sized format. Please note that the ground motion portrayed is for the Design Basis Earthquake (DBE), which is defined in code as 10 percent chance of exceedance in 50 years, with a statistical return period of 475 years (1997 Uniform Building Code, Section 1627). This applies to all "regular" residential and commercial buildings that might be planned for the Bay-Delta area.

   However, the ground motion shown on this map does not necessarily apply to levee construction, which is not under the purview of the Uniform Building Code. Therefore, we recommend the final EIR/S clearly distinguish between the ground motion parameters for residential and commercial structures within the Delta, and for the levees. Further, if some levees are considered more important than others (i.e. if levees differ in their value to the state depending on what particular levees are meant to protect), then ground motion parameters should be customized for individual levees.

   Indeed, the Seismic Vulnerability Report notes that levees will be evaluated based on different parameters than for commercial, residential or essential structures. The report states that a 100-year return period, approximately a 10 percent chance of exceedance in 10-1/2 years will be used for evaluation. However, the final EIR/S needs to be clear on how the earthquake return period of 100 years was selected for levee analysis.

   Also, it should be noted that the earthquake return period of "regular" residential and commercial buildings is 475 years, according to Chapter 16 of the Uniform

Building Code (1997 UBC Section 1627). As previously mentioned, an earthquake with this return period is known as the Design Basis Earthquake, and has a 10 percent chance of exceedance in 50 years. While we acknowledge that the levees are not under the jurisdiction of the Uniform Building Code, we nevertheless point out that an earthquake return period of only 100 years has a low margin of safety. The final EIR/S should review the appropriateness of the Program's acceptable level of safety for the levees, or recommend that decision-makers establish an appropriate value for seismic integrity. Again, different levees might have different levels of earthquake design depending on the level of risk (e.g., protecting property versus lives).

3. We suggest that the final EIR/S use the modern term *Maximum Magnitude* (Mmax) for various faults; these are measured in the moment magnitude scale (not the "Richter" scale as shown in the DEIR/S). Refer to DMG's Open-File Report 96-08, *Probabilistic Seismic Hazard Assessment for the State of California* (Petersen and others, 1996) for more information on this issue.

4. We are not in agreement with statements about the seismogenic primacy of the Foothills Fault System for influencing ground motion in the San Joaquin Valley (Page 5.5-19). As shown on DMG's new Map Sheet 48, *Seismic Shaking Hazard Maps of California*, published July 1, 1999, all of the San Joaquin Valley is dominated by ground motion from the Coast Range–Central Valley Blind Thrust Fault System (e.g., a 1983 Coalinga-type earthquake).

5. In Section 5.5.2, "Areas of Controversy", the fact that there are two entirely different tectonic models for the Delta, which produce substantially different ground motion predictions, should be discussed. These models are the DMG Statewide Model, published in DMG Open-File Report 96-08, and the model described in a 1998 unpublished geology consulting report by Dr. Jeffrey Unruh of Lettis & Associates. (The Unruh report was commissioned by the California Department of Water Resources especially for the CALFED project.) As mentioned, there is a significant difference between the ground motion estimates calculated by these models. Therefore, we suggest that the two models be described in the final EIR/S. Also, we suggest that the Lettis (1998) report be added to the next edition of the DEIR/S CD-ROM as a technical appendix. Unfortunately, a comparative analysis of the two models to enable a discussion of their differences has not yet been conducted.

In summary, the "Seismic Vulnerability of the Sacramento–San Joaquin Delta Levees" is a well-done report, excerpts or the entirety of which would be an asset in the main DEIR/S so that the seismic setting of the Delta is accurately reported.

## Agricultural Land Conservation

The Department's Division of Land Resource Protection (DLRP) monitors farmland conversion on a statewide basis and administers the California Land Conservation (Williamson) Act, the Agricultural Land Stewardship Program, and other land conservation programs. We offer the following comments based upon our experience in agricultural land use and conservation.

1. The DEIR/S provides a good discussion of the project's potential impacts -- both positive and negative -- on agricultural lands and operations in the project area. The DEIR/S also provides a concise and accurate discussion of the Williamson Act and possible impacts of the project on contracted lands. Finally, the DEIR/S includes a credible list of mitigation strategies for addressing the program's impacts on agricultural lands.

2. DEIR/S Mitigation Strategy #8 calls for supporting the Agricultural Land Stewardship Program (ALSP) in acquiring easements on agricultural land. While we believe this strategy has merit, it should be noted that ALSP funds cannot be used for the required mitigation itself, pursuant to Public Resources Code Section 10243. It is possible, however, for ALSP funds to be used to leverage those funds committed by CALFED as mitigation, to provide additional protection of agricultural land resources beyond that determined necessary for mitigation. For example, if a target property consists of 600 acres and mitigation is deemed complete with only 300 acres, it is conceivable that an ALSP grant could be made to provide funding for an easement on the remaining 300 acres (assuming eligibility and selection criteria are met).

   Also, the statutes and regulations governing the selection of agricultural lands for protection via ALSP contain criteria that could have value, as well, in identifying potential target lands for mitigation of program impacts.

   Finally, Mitigation Strategy #8 does not specify the type of "support" that should be given ALSP. We assume that such support would be in the form of financial contributions to the ALSP Fund. If this assumption is correct, it would be consistent with current law (Public Resources Code Section 10230), which allows for the donation of money for the purchase of agricultural land conservation easements. The use of contributions is subject to appropriation by the Legislature, and is not restricted to particular geographic locations. Notwithstanding these conditions, and given the statewide implications of the Bay-Delta program, we believe that it is logical to mitigate the program's adverse effects on agricultural land using a statewide fund that could target compensatory easements strategically to counties where the greatest land conservation gain could be had. In other words, Mitigation

Strategy #8 could be viewed as a statewide "mitigation banking" program for agricultural land conservation.

3. We concur with the general concept of using conservation easements to protect agricultural land as a mitigation measure for the loss or impairment of agricultural land under CEQA. The use of easements is generally consistent with CEQA, which recognizes resource replacement as an acceptable form of mitigation. Indeed, a recent (unpublished) superior court decision pointedly directed one CEQA lead agency to redo its DEIR to include the analysis of the use of conservation easements as a feasible measure to mitigate the loss of agricultural land (El Toro Land Use Planning Authority, et al v. County of Orange, et al, San Diego Superior Court # 710123, October 28, 1997).

   The use of easements as mitigation for the conversion of agricultural land is not a new idea. The strategy has been used in several Northeast and Mid-Atlantic states for many years. In California, the City of Davis, Sonoma County and Caltrans offer examples of local and state governments currently using, or proposing the use of, conservation easements as a form of impact mitigation.

   However, easements cannot be considered a true form of replacement mitigation. While the remaining agricultural land is left better protected by easements, the net stock of agricultural land is still diminished. This dilemma can be partially resolved by an easement "replacement rate" of greater than 1:1. Another issue is the level of replacement for different qualities of agricultural land; i.e., where the quality of land being lost is higher, should the replacement ratio also be higher? The final EIR/S should examine the appropriate easement replacement ratio(s) that should be used to mitigate for the loss of agricultural land.

4. A more typical form of mitigation is avoidance or replacement through "reclamation." The final EIR/S should include mitigation strategies that avoid the location of public improvements (including habitat restoration) on prime agricultural lands, particularly on those in agricultural preserves or under Williamson Act contract. (Government Code Section 51290 sets forth state policy "...to avoid, whenever practicable, the location of any federal, state, or local public improvements and any improvements of public utilities, and the acquisition of land therefor, in agricultural preserves. Whenever it is necessary to locate such an improvement within an agricultural preserve, the improvement shall, whenever practicable, be located upon land other than land under a contract.") The acquisition of agricultural land for non-agricultural uses under the Bay-Delta program should preferentially target lower quality or less economically viable agricultural lands.

The enhancement of currently non-agricultural lands for productive agricultural uses should also be considered as an alternative form of mitigation of farmland conversion. The Department's Important Farmland Series maps, depending on individual counties, include a category of Farmland of Local Importance, a category that often includes lands with prime quality soils that are otherwise not cultivated or irrigated. Where fiscal, physical, regulatory or legal barriers prevent profitable farming of these lands, CALFED could explore investments in time or money to bring these lands into production in order to replace lands converted by the Bay-Delta program.

5. Please correct the Division of Land Resource Protection's web page address to http://www.consrv.ca.gov/dlrp/index.htm (Page 7.1-5).

Oil, Gas and Geothermal Resources

The Department's Division of Oil, Gas and Geothermal Resources (DOGGR) regulates the safe operation and closure of oil, gas and geothermal wells in California. The Bay-Delta region contains producing gas fields. As individual projects that physically affect the land surface are considered for implementation under the program, DOGGR should be contacted for well and production field locations, and for guidance on the development in or around gas fields and active or abandoned wells. Please contact the Division's District 6 office in Sacramento, at (916) 322-1110, for assistance.

The Department appreciates the opportunity to comment on the Bay-Delta programmatic DEIR/S. If you require further information on the Department's earth resources conservation and management programs, or have questions about our comments, please contact the Department's Office of Governmental and Environmental Relations at (916) 445-8733. You may also call me at (916) 322-1080.

Steve Arthur
Chief Deputy Director

Attachments

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